

REMARKS/ARGUMENTS

In the Official Action, the Examiner indicates that claims 4, 5, 8, 9, 15, and 18 are patentable over the prior art and would be allowed if rewritten in independent format. As the Examiner will note by reference to the claim amendments made above, claim 4 has been rewritten to place it into independent format, and therefore the claims which are dependent thereon, namely claims 5, 8, and 9 should also now be in Condition for Allowance.

Claim 1 has been amended to more clearly differentiate it from the Wissinger patent cited by the Examiner. The Wissinger patent relates to a satellite communications system which includes a feedback path for beam control. See, for example, element 44 of Wissinger. However, the beam control appears to adjust all of the transmitted beams uniformly for focusing and pointing (azimuth and tilt). See, for example, the passage at column 3, lines 46-61.

By contrast, claim 1, as amended, recites that a receiving station quantifies "a parameter separately associated with each received optical beam". In Wissinger, there is no parameter "separately associated with each received optical beam" as claimed in claim 1. As such, claim 1 patentably distinguishes itself from Wissinger.

Claim 10, as originally filed, relates to a method of "compensating for phase fluctuations". Claim 10 has been amended slightly to recite "adjusting a phase of at least one of the one or more uniquely tagged optical beams based on the information." This is consistent with the fact that the method compensates for phase fluctuations.

The Examiner cites Wissinger, but Wissinger apparently is concerned with pointing and focus issues and not phase fluctuations. If the Examiner disagrees, then the Examiner is invited to point out with specificity, exactly

where Wissinger teaches anything about phase fluctuations or, indeed, controlling the phase of any of his laser transmitters. As such, it is submitted that claim 10 patentably defines over Wissinger.

Turning now to claim 13, claim 13 has not been amended in response to the rejection. Claim 13, as examined, includes the limitation "the transmitting station using the information to adjust at least one uniquely tagged optical beam to compensate for phase fluctuations." As indicated above, it is not understood where Wissinger teaches anything whatsoever about phase fluctuations or how they might be controlled. If the Examiner disagrees, then the Examiner is invited to point out with specificity where Wissinger teaches anything about adjusting the phases of his laser transmitters or anything about phase fluctuations. As such, it is believed that the rejection of claim 13 is improper and should be withdrawn.

Claim 19 has been amended to recite "means for adjusting a phase of at least one of the one or more uniquely tagged optical beams based on the information." It is believed with that amendment, that claim 19 clearly differentiates itself from Wissinger.

A new claim 21 is added by this response which, in some ways, is similar but certainly not identical to original claim 1. This claim recites, *inter alia*, "a wireless feedback link sending phase information associated with the quantified parameter for each one of the received optical beams..." As such, it is believed that new claim 21 also patentably distinguishes itself from Wissinger.

The Examiner will also note that the references to "free space" have been, for the most part, eliminated from the claims. The reason for this is that many would consider the term "free space" to refer to the vacuum of space as opposed to a region which includes the Earth's atmosphere. However, in the present patent application, as originally filed, it is clear that the term "free

space" is used in a broader sense, and would include the Earth's atmosphere. See, for example, the passage at page 6, lines 18-19, of the application as filed wherein a discussion about the optical beams be emitted into "free space, such as the atmosphere" can be found. See also the passage at page 1, lines 27-28, where the terminology "a free space environment, such as the atmosphere" can be found.

Given the fact that the term "free space" is given a very broad definition in the specification, it is felt that it is not particularly useful to have the terminology in the claims and therefore it has been deleted therefrom except for the recitation found in claim 5 wherein an amendment has been made to refer to "an atmosphere or free space". In new claim 21 the term "free space" has not been used, but instead the beams are referred to as being unguided to reflect the fact that in terms of that claim the beams are not in a waveguide and thus behave as if they are in free space (including the atmosphere, etc.). The deletion of "free space" terminology language from the amended claims in no way narrows those claims.

Graves

The Examiner asserts that it would have been obvious to combine Wissinger and Graves in rejecting claim 11. The rationale given by the Examiner is to control "interference affect". Why do that in Wissinger which teaches a satellite to satellite communication system? Where is the interference coming from? Moreover, note that Graves teaches using his system over "reasonable distances" which he defines as 1 km to 2 km and "perhaps beyond". See paragraph 0031 of Graves. How close are satellites in a Wissinger-type communication scheme?

Moreover, even assuming there were motivation to combine Wissinger and Graves, note that Graves teaches independent deformable mirrors (DM) and wavefront sensors (WFS) at each end (or only one end) of his communication links. Each (or at least one) satellite in Wissinger would then end up with its very own deformable mirror and wavefront sensor combination following the teachings of Graves. The Graves WFS to DM feedback path is local. No phase information appears to be needed to be transmitted from receiver to transmitter. So no phase information would travel over Wissinger's link between Wissinger's elements 40 and 42 if Graves is grafted onto Wissinger.

Note, also, that the extension of Graves from a single to multiple telescopes at a given end of the communications link requires sensing the phase shift of each telescope so that "each telescope should [either] be controlled to much better than a wavelength" (see paragraph 0031). Graves describes the need for a "second wavefront sensor to determine the relative path delays, or piston errors that occur between the disparate apertures," which necessarily requires an additional local control at the given end of the link. Graves is rather clear in teaching how to manage phase errors and Graves' technique does not require phase information to travel over Wissinger's link between Wissinger's elements 40 and 42.

Reconsideration of this application as amended is respectfully requested.

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this response as including a petition to extend the time

period pursuant to 37 CFR 1.136 (a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

I hereby certify that this correspondence is being deposited with the United States Post Office with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

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(Date of Transmission)

Mary Ngo

(Name of Person Transmitting)

[Signature]

(Signature)

March 19, 2007

(Date)

Respectfully submitted,

[Signature]

Richard P. Berg

Attorney for the Applicant

Reg. No. 28,145

LADAS & PARRY

5670 Wilshire Boulevard,

Suite 2100

Los Angeles, California 90036

(323) 934-2300 voice

(323) 934-0202 facsimile